

REMARKS/ARGUMENTS

The Examiner is specifically thanked for the courtesies extended during the interview of August 11, 2010. During the interview, claims 1 and 32-39 were discussed in relation to the applied prior art references, especially Demissie et al. (U.S. Patent No. 6,777,119). Applicant's representative argued that the prior art does not show externally tapping off hydrogen that is not recycled and does not show structure to control the amount of hydrogen recycled or tapped off. In addition, Applicant's representative and Examiner discussed the scope and interpretation of the term "externally" with regard to the claimed power generation apparatus and whether the hydrogen tapped off in the recycle loop of Demissie et al. was then "externally" sent to the burner. Applicant respectfully suggested that the burner of Demissie et al. was not external and therefore did not disclose the claim term "externally." The Examiner suggested that further discussion on the record regarding the word "externally" should be presented. In regard to the controlling arrangement with valve 38 of Demissie et al., the Examiner is of the position that, when valve 38 is completely or partially closed, the valve would have an affect on the amount of hydrogen tapped off from the recycling loop. The Examiner especially refers to column 6, lines 12-18 of Demissie et al., which the Examiner suggests teaches a means to address the amount of hydrogen to be further recycled and the hydrogen to be tapped off from the recycling loop. Applicant submits this response in view of the Examiner's apparent willingness to consider further arguments regarding at least these points.

Applicant notes with appreciation that the Examiner has withdrawn the claim rejections under 35 U.S.C. § 101 and the claim rejections under 35 U.S.C. § 112, first paragraph.

Claims 1 and 32-39 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Demissie et al. (U.S. Patent No. 6,777,119, hereinafter "Demissie") in view of Yokota (U.S. Patent Application Publication No. 2002/0085967). According to

the Examiner, Demissie teaches a power generation apparatus including a fuel cell 12 with an anode 16 and a reforming module 18. The Examiner is further of the opinion that the apparatus is arranged so that hydrogen is fed from the reforming module to anode 16 of the fuel cell as described in column 3, lines 13-17 and that the apparatus includes a recycling arrangement to recycle hydrogen in the outflow stream of anode 16 of the fuel cell back to anode 16 as represented by reference numeral 28. The Examiner is also of the opinion that a control arrangement 50 controls the amount of hydrogen recycled and taps hydrogen off externally at 34 that is not recycled as explained in column 5, line 66 through column 6, line 18 and shown in Figure 1. The Examiner does recognize that Demissie fails to teach the reforming module being configured to separate hydrogen from other components, but addresses this deficiency with reference to Yokota. According to the Examiner, Yokota teaches a process and apparatus for generating hydrogen and carbon dioxide which may be used for a fuel cell as discussed in paragraphs 2, 7 and 59. The Examiner is of the opinion that it would have been obvious to one of ordinary skill in the art at the time the invention was made to create the electrical current generating system of Demissie having an apparatus from Yokota wherein carbon dioxide is absorbed to form metal carbonates because Yokota teaches an arrangement that can remove carbon dioxide from the hydrogen stream. This rejection is respectfully traversed.

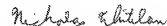
The claimed invention is directed to an integrated fuel cell and reformer. The reformer receives a hydrocarbon fuel which it reforms into hydrogen and other components, e.g., carbon dioxide. The hydrogen is then separated from the other components, with the hydrogen being fed back to the anode inlet of the fuel cell. The outflow stream from the anode to the fuel cell can either be recycled back to the anode inlet or tapped off to be used externally from the claimed apparatus, with the amount of hydrogen that is recycled being controlled by a controlling arrangement. Generally, the prior art does not show either the ability to tap off or recycle hydrogen, with the amount going either way being controllable. More specifically, Demissie discloses a fuel cell power plant 10 as shown in Figure 1 including a system to ensure that the water in a fuel cell 12 is balanced between being supplied to an anode 16 and taken away from a cathode

14. The power plant includes a reformer 18 which reforms the hydrocarbon fuel to produce a supply of hydrogen for the fuel cell. More importantly, exhaust 26 from the anode outlet of the fuel cell is either recycled back to the anode inlet or is sent to a burner 32 to combust any remaining fuel, in this case hydrogen. Exhaust 34 from burner 32 is then expelled as discussed in column 3, lines 50-56 of Demissie. **No hydrogen can be tapped off externally as it is all recycled or combusted.** Also, although Demissie discloses a controller 50, there is no use of controller 50 to regulate the amount of hydrogen recycled and, corresponding, actually no structure in controller 50 to perform this function as recited in claim 1. Claim 1 specifically recites a controlling arrangement to control the amount of hydrogen recycled and to tap off externally hydrogen that is not recycled. As set forth in the specification on page 20, line 20, the non-recycled hydrogen is employed for external use. This is directly contrary to Demissie which requires all the hydrogen not being recycled to be burned off and thus not used externally. As can be seen in Figure 1, the outflow from anode that is passed through burner 32 has no hydrogen because burner 32 combusts any remaining fuel.

In summary, Demissie has absolutely no disclosure concerning any externally tapping off of hydrogen that is not recycled from any outflow stream of the anode as recited in claim 1. Rather, Demissie discloses that any hydrogen not recycled is sent to burner 32 and therefore no hydrogen is tapped off externally. Furthermore, Demissie does not disclose any control of the amount of hydrogen leaving exhaust stream 26 of the anode that is recycled back (portion 28) to the anode inlet when it is fed to the burner 32. Rather, the disclosure in Demissie of a pressure control valve 53 cannot be used to adjust the amount of hydrogen recycled or tapped off, particularly as pressure control valve 53 is located just before exhaust 34 which is well past the point at which anode outflow stream 26 is split into recycle portion 28 and portion 30 which is fed to burner 32. At the point in which the flow hits the pressure valve, the outflow stream from the anode has passed through burner 32 which combusts any remaining fuel so there is no hydrogen which remains to be controlled.

Based on the above remarks, it is respectfully submitted that the present invention is patentably defined over the prior art of record such that allowance of all claims and passage of the application to issue are respectfully requested. If the Examiner should have any additional questions or concerns regarding this matter, the Examiner is cordially invited to contact the undersigned at the number provided below in order to further prosecution.

Respectfully submitted,



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